

WHAT IS CLAIMED IS:

1. A gear state diagnostic method using frequency demodulation comprising:
 - (a) detecting a voltage value that is linked to changes in rotational speed of a gear, the voltage value being output by a pulse generator;

5 (b) performing frequency modulation of the voltage value by monitoring means;

(c) acquiring the rotational speed of the gear by performing frequency demodulation of the frequency modulated voltage value; and

(d) monitoring the demodulated frequency and tracking changes in rotation of the gear to determine whether there are errors in the gear.

2. The method of claim 1 wherein in step (a), the voltage value being output by the pulse generator is expressed as a square wave.

3. The method of claim 1 wherein in step (a), the voltage value being output by the pulse generator is expressed as a sawtooth wave.

4. The method of claim 1 wherein in step (d), it is determined that there are errors in the gear if a trace of changes in rotation of the gear is non-uniform.

5. The method of claim 1, wherein said step (c) employs a sampling method.

6. A gear state diagnostic method, comprising:
 - generating a signal corresponding to a rotational gear speed;
 - modulating said signal;
 - demodulating said signal to acquire the gear rotational speed;
 - monitoring the demodulated signal;
 - tracking changes in gear rotation based on said monitored signal; and
 - determining whether errors are present in the gear based on said tracked changes.

11037-003-999

7. The diagnostic method according to claim 6, further comprising sampling the modulated signal and wherein said demodulating is a demodulating of the sampled signal.

5 8. The diagnostic method according to claim 6, wherein said determining step comprises determining whether the changes in gear rotation are non-uniform.

9. The diagnostic method according to claim 6, wherein said signal is a voltage value corresponding to rotational gear speed.

10 10. The diagnostic method according to claim 9, wherein said voltage value is generated by a pulse generator.

11. The diagnostic method according to claim 9, wherein said modulating step is a frequency modulation and said demodulating step is a frequency demodulation.

15

11037-003-999